BELT SANDER WITH SANDING DEPTH REFERENCE MEMBER

The present invention relates to a belt sander, comprising a housing, two rollers which are bearing mounted in the housing and which are adapted to guide a sanding belt, wherein a sanding surface lies parallel to the common external tangent plane of the rollers and wherein a sanding area is located between the rollers in the sanding surface, a support structure placed between the rollers for supporting the sanding belt, and a sanding depth reference member extending on at least one side of the sanding area for the purpose of obtaining a reference surface.

Such belt sanders are generally known.

Such belt sanders are used to sand large surfaces, for instance to make them flat and smooth or to remove a paint or varnish layer. It is important here that the sanded surface remains or becomes as flat as possible.

A sanding depth reference member, or sanding frame, known from the prior art for determining the sanding depth prevents the belt sander being used for too long at one position so that the surface for sanding is locally sanded too deeply, and the sanded surface is provided with recesses. Known sanding frames are mounted on the housing. They can be adjusted relative to the housing to bring about a predetermined sanding depth or to take into account the belt thickness of the sanding belt. Because of tolerances in the housing, the sanding frame and the fitting between the two components, the reference surface of the sanding frame often assumes a position which is not parallel to the active part of the sanding belt. It is therefore not possible to ensure that the sanded surface is flat.

The object of the present invention is to provide a belt sander wherein the above stated drawbacks are obviated.

This objective is achieved with a belt sander of the type described in the introduction with the feature that the sanding depth reference member lies against the support structure and is adapted to support the sanding belt in the sanding area.

The fact that the sanding depth reference member is located during use between the support structure and the sanding belt ensures that the reference surface of the sanding depth reference member and the active part of the sanding belt run parallel to each other, and that the sanded surface is flat.

According to a first preferred embodiment, the sanding depth reference member extends on two opposite sides of the sanding area. Making sloping recesses in the surface for sanding is hereby prevented. These two sides, or reference surfaces, are preferably situated laterally of the belt sander as seen in the sanding direction.

An even greater improvement results when the sanding depth reference member extends on four sides of the sanding area, so that the reference surfaces on the rear and front of the belt sander, when this latter is placed on the workpiece, prevent variations occurring in the sanded surface.

In another preferred embodiment, the sanding depth reference member comprises a recess for receiving the sanding belt. The support surface for the sanding belt lies a small distance above the reference surface (i.e. in a direction toward the housing), thereby preventing sanding deeper than the distance between the active surface of the

sanding belt and the reference surface of the sanding depth reference member.

Many users wish to be able to sand to different depths. It is thus desired generally to sand more rapidly or bring about greater removal using coarse sandpaper than with fine sandpaper. In order to take account hereof, the sanding depth is adjustable in that a part of the sanding depth reference member is adjustable in the height (i.e. in a direction toward the housing).

Because sanding operations are usually performed successively in strip-wise manner, it is attractive if the sanding depth reference member is height-adjustable on one side of the sanding area. The difference between the already sanded part of the surface and the part of the surface yet to be sanded can hereby be set.

A structurally simple embodiment is obtained when the sanding depth reference member comprises a bent metal plate.

A specific preferred embodiment provides the measure that the plate comprises a plate strip on one side of the sanding area, the length of which strip transversely of the axis of each roller is greater than the corresponding length of the support structure. Unwanted damage to the workpiece is hereby prevented since the belt sander can no longer be placed with an edge of the support structure on the workpiece.

In an alternative embodiment, the plate comprises a plate strip on one side of the sanding area, the length of which strip transversely of the axis of each roller is substantially the same as or smaller than the corresponding length of the support structure. It will hereby be simpler to arrange a sanding belt when the reference member is mounted on the belt sander.

Preferably then further located opposite the plate strip is a second plate strip which is connected to plate strips extending on the front and rear sides of the rollers. A reference surface is hereby also obtained at the front and rear of the sanding area.

The sanding depth reference member is fixed in vertical direction between the support structure and the sanding belt. Specific measures are necessary to prevent movement in horizontal direction, and particularly in two mutually perpendicular directions in the horizontal plane. The present invention provides for this purpose the measure that the sanding depth reference member comprises a fixation ear extending to the support structure.

This fixation ear can be fixed in simple manner to the sanding depth reference member, or it can be punched in simple manner out of the sanding depth reference member and bent in the direction of the support structure. The fixation ear can engage in a recess arranged specially for this purpose in the support structure.

Other attractive preferred embodiments are stated in the remaining claims.

The present invention will be elucidated hereinbelow on the basis of the accompanying figures, in which:

Figure 1 shows a perspective view of a belt sander provided with a sanding depth reference member according to the invention;

Figure 2 shows a view corresponding with figure 1 of the underside of the belt sander;

Figure 3 is a view corresponding with figure 1 of a belt sander wherein the sanding belt and the sanding depth reference member are shown separated from the belt sander;

Figure 4A is a side view of the belt sander shown in figures 1-3 during the start of a sanding operation;

Figure 4B shows a view corresponding with figure 4A during performing of a sanding operation;

Figure 5 shows a cross-section along V-V in figure 4A;

Figure 6 shows a detail view of a construction which can be used to adjust the height of the sanding depth reference member;

Figure 7 is a perspective view of a second embodiment of a sanding depth reference member, and

Figure 8 is a perspective view of a third embodiment of a sanding depth reference member according to the invention.

Figure 1 shows a belt sander designated as a whole with 1. Belt sander 1 is provided with a housing 2. Two rollers 3, 4 are bearing mounted in this housing 2. A sanding belt 5 is trained around these rollers 3, 4. At least one of the rollers 3, 4 is drivable in rotation by means of an electric motor accommodated in housing 2.

In order to limit the sanding depth, and thereby achieve flat sanding more easily, belt sander 1 is provided with a sanding depth reference member embodied as a plate and designated as a whole with 6. The sanding depth reference member 6 can likewise be seen in figure 2, which shows a view of the underside of belt sander 1. This shows that the sanding depth reference member 6 extends partly under sanding belt 5. The sanding depth reference member 6 is fixed in vertical direction between sanding belt 5 and a support member 7.

Figure 3 shows how the diverse components are assembled. The construction of the sanding depth reference member 6 embodied as a plate is also shown more clearly.

The sanding depth reference member 6 comprises a plate part 8 which is adapted to be fixed between support member 7 and sanding belt 5. For fixing in horizontal direction the plate part 8 is provided with two curved edges 9, 10. The curved edges 9, 10 extend on either side of support member 7 and co-act therewith to prevent the reference member 6 being able to displace in the direction of movement of belt sander 1. The outer edges of curved edges 9, 10 can however also be used for fixing transversely of the direction of movement of belt sander 1.

Another possibility for fixing reference member 6 in horizontal direction are fixation ears 11 which protrude into recesses of support member 7. The three fixation ears 11 in figure 3 bring about a fixing of reference member 6 in two directions at right angles to each other in the horizontal plane. Instead of using support member 7, use can for instance also be made herefor of the housing 2 of sanding belt 5 or optionally of any other parts fixedly connected to sanding belt 5.

Plate part 8 is formed integrally with a plate strip 12 extending on one side of plate part 8. Plate strip 12 hereby forms a reference surface on one side of sanding belt 5. Plate strip 12 has a length transversely of the axis of rollers 3,4 which is substantially equal to the corresponding length of support structure 7. It is hereby possible to move belt 5 over plate strip 12.

A U-shaped plate part 13 is formed on the edge of plate part 8 remote from plate strip 12. Plate part 13 is also formed integrally with plate part 8. It has the specific form to provide a reference surface on the side of the sanding belt opposite plate strip 12 as well as on the front and rear sides of sanding belt 5 in the direction of

movement thereof. Plate strips 13A and 13B are provided for this purpose.

On its outer edges the reference member 6 is slightly bent so as to be able to slide more easily over the surface for sanding and to make the otherwise flat structure more rigid.

Figure 4A shows how such a belt sander 1 can be handled. Belt sander 1 is initially placed for this purpose with the leading edge of the sanding depth reference member 6 on a workpiece 15. Belt sander 1 is then moved downward at the rear in the direction of arrow 16 until the situation of figure 4B is obtained. The reverse sequence is however also possible: the belt sander is placed with the rear edge of reference member 6 on workpiece 15, whereafter the front side of belt sander 1 is laid on the workpiece. Finally, it is also possible to place belt sander 1 on the workpiece first on the left-hand side and then on the right-hand side, or vice versa, or place it flat on the workpiece in a single action.

Figure 5 shows in more detail the effect of the sanding depth reference member 6. Here can be seen that plate part 8 is arranged recessed relative to plate parts 12, 13. Sanding belt 5 is hereby situated below the level of the sanding depth reference member 6, wherein a defined sanding depth is obtained which corresponds to the dimension "Y" as shown in figure 5. The belt thickness of sanding belt 5 can thus be taken into account.

Finally, figure 6 shows a construction for making the height adjustable of a part of the sanding depth reference member 6. It is thus possible for instance to make only that part of the sanding depth reference member 6 intended to support on the as yet unsanded part, for instance on the front side and on one side, adjustable

relative to the part intended to support on the already sanded surface.

Use is preferably made here of two parallel plates 17, 18 coupled to each other by means of at least two inclining surfaces 17A, 17B; 18A, 18B, and wherein the inclining surfaces rest on each other. The inclining surfaces provide for the conversion of a horizontal movement to a vertical movement. The horizontal movement is produced by means of an adjusting screw 20. It will be apparent that other possibilities for a sanding depth setting are also available.

Finally, figures 7 and 8 show embodiment variants of a sanding depth reference member 6 according to the invention. Components corresponding to the embodiment of figure 3 are designated with the same reference numerals. In the embodiment of figure 7 the plate part 8 is coupled only to the U-shaped plate part 13. Compared to the embodiment of figure 3, plate strips 13A, 13B are lengthened so that the free edge thereof lies substantially in line with the free edge of plate part 8. This reference member 6 provides reference surfaces on one side and the front and rear of sanding belt 5. It is hereby possible to sand up to an obstacle protruding from the surface for sanding, such as a wall, pillar or a skirting board.

The embodiment of figure 8 shows a reference member 6 formed from a substantially rectangular plate part 21. Openings 22 are provided in plate part 21 for passage of sanding belt 5 during use. In addition to fixing the reference member 6 as already stated above, the curved edges 9, 10 also serve to guide the sanding belt 5. Reference member 6 provides reference surfaces around sanding belt 5 and leaves a relatively small passage at two locations 23 for arranging sanding belt 5.

Although the sanding depth reference member 6 shown in the drawings is embodied as a bent metal plate, such a reference member can also be manufactured in other ways and from other materials. It is thus possible to injection mould the reference member from plastic. Another example is to embody the reference member as aluminium casting.